



## Isolating and Characterising Chitinolytic Thermophilic Bacteria from Cangar Hot Spring, East Java

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### ABSTRACT

In the present study, chitinolytic thermophilic bacteria were collected from Cangar hot spring, East Java, Indonesia and screened. The 16S rRNA gene sequencing was used to identify the isolated bacterium which showed highest chitinolytic activity. The identified isolate was then characterised based on morphological and physiological analyses. The results showed the isolated bacterium belonged to *Bacillus licheniformis*. This isolate produced large amounts of chitinase on 0.9% (w/v) colloidal chitin (pH 7.0) at 52°C in a very short time (24 hours). Two pairs of primer were designed to detect the presence of glycosyl hydrolase (GH) 18 chitin domain sequences in the isolated bacterium. Two amplicons sized ~250 bp and ~1000 bp were obtained from PCR process. Then the amplicons were sequenced and analysed. The sequencing results showed the isolated *Bacillus licheniformis* was proven to have genes encoding *ChiA* and *ChiC* domain.

**Keywords:** *Bacillus licheniformis*, *ChiA*, *ChiC*, thermophilic bacteria, thermostable chitinase

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### INTRODUCTION

Chitinases (EC 3.2.1.14) are grouped into either Family 18 or Family 19 under glycosyl hydrolases superfamily which is capable of degrading chitin into its derivatives by hydrolysing the  $\beta$ -1,4-glycosidic bonds between the N-acetylglucosamine residues (Shaikh & Deshpande, 1993). Nowadays, the demand for chitinase with new or desirable properties has increased due to a wide-range of industrial application of chitin derivatives, such as chitoooligosaccharides and

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